orchids. Several distinct zones of vegetation can be distinguished. The peculiarities of the fauna can be correlated directly with the vegetation.—Col. M. J. **Godfery**: The fertilisation of the orchid genus Cephalanthera. The author holds that Cephalanthera is an old genus, and was not derived from Epipactis.

PARIS.

Academy of Sciences, June 6.—M. Georges Lemoine in the chair.—The president announced the death of M. J. B. A. Gaillot, correspondant for the section of astronomy.—G. **Friedel**: The calculation of the intensity of X-rays diffracted by crystals: A correction.—S. **Pincherle**: An integral equation in the complex domain.—B. **Gambier**: Applicable surfaces and the equation of Laplace.—M. **Auric**: The theory of ideal algebraical numbers.—A. **Tian**: The stability and the reversibility of the transformations of the hydrosols obtained by the hydrolysis of salts.—Mlle. **Wolff**: Studies on the molecular refraction and specific rotatory power of furfuralcamphor and some of its derivatives.—Mlle. S. **Veil**: Allotropic varieties of oxides. The conductivity of various metallic oxides measured at varying temperatures has been shown to increase with the temperature, similarly to electrolytes. Magnetic iron oxide and cadmium oxide offer peculiarities, since the conductivity-temperature curves for these show points of inflection. These changes can be attributed to the formation of allotropic forms of the oxides.—C. **Chéneveau**: The variation of the specific refraction of dissolved salts in dilute solution. A study of the specific refraction of dilute solutions of ammonium nitrate, potassium chloride, and magnesium nitrate.—M. **Billy**: The peroxide of titanium. The hydrates of titanium, hitherto regarded as derived from the oxide TiO_3, are shown to be complexes of hydrogen peroxide and the peroxide Ti_2O_5.—E. **André**: Contribution to the study of the oils from grape-seeds.—J. **Martinet** and O. **Dornier**: Some new sulphonic derivatives of oxindol and of isatin.—A. **Mailhe** and F. **de Godon**: The preparation of mixed secondary and tertiary phenolic amines. The vapours of aniline and ethyl alcohol passed over alumina at 350° to 380° C. gave a mixture of mono- and di-ethylanilines. The method is shown to be of general application.—F. **Zambonini**: The palmierite of Vesuvius and the minerals which accompany it.—M. **Romieux**: The controversy as to the displacement of shore levels and the phenomena of equideformation.—J. **Cvijić**: Relief of the seashore and river terraces.—A. **Carpentier**: Discovery of a Weald flora in the neighbourhood of Avesnes.—P. **Schereschewsky**: Systems of clouds. Suggestions for a new system of cloud observations. Different states of the sky should be observed simultaneously from a number of stations spread over a wide area.—O. **Mengel**: Influence of the relief and of the heating of the soil on surface winds.—M. **Bridel** and R. **Arnold**: A method allowing the application to plants of the biochemical method of detecting glucose. The method is based on the property possessed by emulsin of causing the combination of glucose with the alcohol holding it in solution. Full details of the technique of extraction and purification of the plant product before submitting it to the action of the emulsin are given. —N. T. **Giung**: The botanical determination of foreign beans.—G. **Bioret**: The Graphideæ.—E. **Chatton**: False and true myogenesis in the pelagic Copepods. An error due to the non-recognition of cœlomic parasitic Peridinians.—C. **Pérez**: A supposed interstitial tissue in the testicle of lizards. A criticism of a recent communication on the same subject by M. Christian Champy.—H. **Bierry** and F. **Rathery**: Liver, blood plasma, and proteid sugar. The authors point out what they believe to be a function of the liver not hitherto noted, a qualitative and quantitative change in the composition of the blood plasma after passing through the liver.—J. P. **Langlois**: A moving belt for the study of walking and of work. A modification and improvement of a similar apparatus set up by Benedict at Washington.—MM. H. **Vallée** and **Carré**: Anti-aphthous hæmo-prevention and hæmo-vaccination.—G. **Bourguignon**: Chronaxy in neuromuscular Wallerian degenerescence in man.

NEW SOUTH WALES.

Linnean Society, April 27.—Mr. G. A. Waterhouse, president, in the chair.—G. I. **Playfair**: Australian fresh-water flagellates. An account of the forms known from collections made in the neighbourhood of Sydney and Lismore. Mention is made of 172 forms representing 39 genera, of which 96 forms and 1 genus are new.—Dr. R. **Greig-Smith**: Note upon the extraction of acids from cultures. In testing the products of fermentation of dextrose by a film yeast, succinic acid was obtained as the only fixed acid. The extraction of the fixed acids from bacterial or from yeast cultures is a monomolecular reaction. The preparation of salts by neutralising the acids until a pink colour is obtained in the presence of phenolphthalein may be faulty because the reaction is slower than is generally supposed.—Dr. A. B. **Walkom**: The occurrence of Otozamites in Australia, with descriptions of specimens from Western Australia. Three species of Otozamites and some obscure coniferous remains are described from near Mingenew. The rocks in which they occur consist of dark red ferruginous sandstone, which, with its wide distribution, constitutes an important stratigraphical horizon, and probably indicates a warm, moist climate for northern Australia in Jurassic time.

Books Received.

Le Mouvement scientifique Contemporain en France. No. 1: Les sciences naturelles. By Dr. G. Matisse. Pp. 160. (Paris: Payot et Cie.) 4 francs.

Relations intellectuelles avec les Centraux? "Ecrasons l'Infâme." By Maurice Lecat. Pp. viii+128. (Louvain, Ave. des Alliés 92; Bruxelles, Ave. bois Cambre 16: The Author.)

Faune de France. By P. Paris. No. 2: Oiseaux. Pp. iv+473. (Paris: P. Lechevalier.) 40 francs.

Handbook of Chemistry and Physics: A Ready-Reference Pocket Book of Chemical and Physical Data. By Prof. C. D. Hodgman and others. Eighth edition. Pp. 711. (Cleveland, Ohio: Chemical Rubber Co.) 3 dollars.

Imperial Institute: Indian Trade Enquiry. Reports on Timbers and Paper Materials. Pp. ix+57. (London: J. Murray.) 4*s*. net.

Psychoanalysis, Sleep and Dreams. By Andre Tridon. Pp. xiii+161. (London: Kegan Paul and Co., Ltd.) 7*s*. 6*d*. net.

A Dictionary of Chemical Solubilities: Inorganic. By Dr. A. M. Comey. Second edition, enlarged and revised. Pp. xviii+1141. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd.) 72*s*. net.

La Radiologie et la Guerre. By Prof. Mme. P. Curie. Pp. 144+xvi plates. (Paris: F. Alcan.) 8 francs.

British Mammals. Written and illustrated by A. Thorburn. (In 2 vols.) Vol. ii. Pp. vi+108+plates 26–50. (London: Longmans, Green and Co.) 10*l*. 10*s*. net the 2 vols.

Common Stones: Unconventional Essays in Geology. By Prof. G. A. J. Cole. Pp. 259. (Common

© 1921 Nature Publishing Group

Things Series.) (London and New York: A. Melrose, Ltd.) 6*s*. net.

Human Embryology and Morphology. By Sir A. Keith. Fourth edition, revised and enlarged. Pp. viii+491. (London: E. Arnold.) 30*s*. net.

The National Physical Laboratory: Report for the Year 1920. Pp. 132. (London: H.M. Stationery Office.) 5*s*. net.

Espace, Temps et Gravitation: La Théorie de la Relativité généralisée dans ses Grandes Lignes. By Prof. A. S. Eddington. Ouvrage traduit de l'Anglais by J. Rossignol. Pp. xii+262+iv+149. (Paris: J. Hermann.) 28 francs.

Liverpool Marine Biology Committee. Memoirs on Typical British Marine Plants and Animals. No. xxiv.: Aplysia. By Nellie B. Eales. Pp. viii+84+7 plates. (Liverpool: University Press.) 4*s*. 6*d*.

Memoirs of the Geological Survey. Special Reports on the Mineral Resources of Great Britain. Vol. xviii.: Rock-Salt and Brine. By Dr. R. L. Sherlock. Pp. vi+123+2 plates. (London: E. Stanford, Ltd.; Southampton: Ordnance Survey Office.) 5*s*. net.

Some Wemba Words: Some Meanings and Explanations. By E. B. H. Goodall. Pp. 140. (London: Oxford University Press.) 7*s*. 6*d*. net.

The Treaty Settlement of Europe: Some Geographic and Ethnographic Aspects. By Prof. H. J. Fleure. (The World of To-Day.) Pp. 83. (London: Oxford University Press.) 2*s*. 6*d*.

Diary of Societies.

THURSDAY, June 30.

Institution of Civil Engineers (Engineering Conference), at 10 a.m.—W. W. Grierson: The Use of Reinforced Concrete on Railways.—H. J. Fereday: Impact Tests and Allowances.—A. H. Hall: The Influence of the Automatic and Semi-automatic Machine on the Skill and Resourcefulness of the Mechanic and Operator.—A. Musker: Mechanical Appliances and Labour in Loading and Unloading Ship's Cargoes.—Prof. W. E. Dalby: The Elastic Limit.—Prof. E. G. Coker: The Effect of Scratches in Materials.—C. P. Sandberg: Damage to Tires and Rails caused by Brakes or Slipping Wheels.—G. Hatton: The Existing Practice of Inspecting Work and Materials.—M. E. Denny: The Design of Fabricated Ships from the Labour-saving Point of View.—J. C. Telford: Economy of Labour on Shipbuilding as effected by Fabricated Ships, etc.—E. R. Mumford: Recent Tank Research in Screw Propellers.—E. H. Richards and M. G. Weekes: Straw Filters for Sewage-purification.—J. Haworth: Activated Sludge.—J. D. Watson: De-watering Sludge.—J. Dalziel: Battery Locomotives.

Institution of Mechanical Engineers, at 10.15 a.m.—Conference on the Means of Improving the Thermal Efficiency of Heat Power Plants.—H. E. Wimperis: Internal-combustion Engine Theory, with relation to Higher Economy.—F. Samuelson: High Steam-Pressure and other Means of increasing Economy of Steam-Engines.—E. V. Evans: Chemistry of Combustion.—A. Hutchinson and F. Bainbridge: Blast-Furnace Gases.—D. Wilson: Boiler-House Management (General Causes of Boiler Inefficiency).—Prof. W. A. Bone: Low Temperature Carbonisation.—H. Dunell: Engine-House Management (General Causes of Steam-Engine Inefficiency).—A. E. L. Chorlton: Super-Compression.

Royal Society, at 4.30.—Sir J. J. Dobbie and Dr. J. J. Fox: The Absorption of Light by Elements in a State of Vapour. The Halogens.—Prof. W. A. Bone and the late W. A. Haward: Gaseous Combustion at High Pressures. Part II. The Explosion of Hydrogen-Air and Carbon-monoxide-Air Mixtures.—Prof. A. E. H. Love and F. B. Pidduck: Lagrange's Ballistic Problem.—J. Proudman: The Principles of Internal Ballistics.—R. H. Fowler: A Simple Extension of Fourier's Integral Theorem and Some Physical Applications in particular to the Theory of Quanta.—Capt. D. Brunt: The Dynamics of Revolving Fluid on a Rotating Earth; and other papers.—The following papers will be read in title:—Takeo Shimizu: A Preliminary Note on Branched α-ray Tracks.—Takeo Shimizu: A Reciprocating Expansion Apparatus for detecting Ionising Rays.—Prof. R. W. Wood: The Time Interval between Absorption and Emission of Light in Fluorescence.

FRIDAY, July 1.

Institution of Civil Engineers (Engineering Conference), at 10 a.m.—R. G. H. Clements: Road Vehicles and their Relation to Road Surfaces.—A. Dryland: Advantages of Bituminous Macadam.—C. H. J. Clayton: The Conservancy and Maintenance of Rivers from the Point of View of Land Drainage.—R. F. Grantham: The Effect of Sluices and Barrages on the Discharge of Tidal Rivers.—G. E. W. Cruttwell: The Utility of Models for Estuarial Experiments.—H. C. Reid: The Relative Advantages of Dredging and Training-walls in Estuaries.—E. Latham: The Use of Inertia Gauges in Pile Driving.—A. L. Bell: The Bearing Power of Soils.—Sir James McKechnie: Internal-combustion Engines with Large Cylinders.—Sir Vincent L. Raven: The Mechanical Advantages of Electric Locomotives compared with Steam.—T. Crook: The Effect of the War on Mineral Supplies.—M. Deacon: The Utilisation of Exhaust Steam in Turbines.—W. C. Mountain: Steam *versus* Electric Winding.—S. Cowper-Coles: The Relative Values of Protective Metallic Coatings for Iron and Steel.—J. Richardson: Recent Progress in Large Diesel Engines for the Mercantile Marine.—R. J. Walker and S. S. Cook: Experience with Marine Turbine Reduction-gears.—E. Sandeman: Compensation Water.—F. W. Macaulay: Pipes for Pressure Conduits.—Dr. H. Lapworth: The Relation of Run-off to Rainfall.—Economic Limits of Distribution from Coal-fired Stations.—B. Welbourn: Low-voltage Overhead Distribution.

Institution of Mechanical Engineers, a; 10.30 a.m.—Conference on the Means of Improving the Thermal Efficiency of Heat Power Plants.—R. Nelson: Waste-Heat Utilisation.—Sir Henry Fowler: Superheating.—Dr. W. R. Ormandy: Liquid, Colloidal, and Powdered Fuels.—H. Moore: Liquid Fuels (Internal-combustion Engines).—A. W. Bennis: Automatic Stokers.—W. H. Patchell: Air Heating for Boiler Furnaces.—C. E. Stromeyer: Feed-Heating and Economisers.—Prof. W. E. Dalby: The Indicator as an Aid to Economy.

Geologists' Association (in Architectural Theatre, University College), at 7.30.—H. Bury: Some High-level Gravels of North-East Hampshire.

MONDAY, July 4.

Royal Botanic Society of London, at 3.—Prof. A. R. Bickerton: The Generic Simplicity and Great Importance of Basic Principles in all Scientific Work. (1) The General Graphics of Science.

Royal Institution of Great Britain, at 5.—General Meeting.

Aristotelian Society (at University of London Club, 21 Gower Street), at 8.—Dr. F. C. S. Schiller: Arguing in a Circle.

WEDNESDAY, July 6.

Royal Society of Medicine (Annual General Meeting), at 5.—Presentation of Gold Medal to Sir Almroth Wright.

THURSDAY July 7.

Medico-Legal Society (Annual General Meeting) (at 11 Chandos Street, W.1), at 8.30.—Prof. A. Louise McIlroy: Some Factors in the Control of the Birth-rate.

CONTENTS.

PAGE

American and British Superannuation Systems . 545
Lord Rayleigh's Scientific Papers 546
Studies of British Mammals 547
Forestry in France 548
Our Bookshelf 549

Letters to the Editor:—

Co-operative Indexing of Periodical Literature.—**Dr. F. A. Bather, F.R.S.; Prof W. M. Flinders Petrie, F.R.S.; Dr. John W. Evans, F.R.S.; Arthur Percival Newton; Stephen Gaselee, C.B.F** 550
W. Warde Fowler: A Personal Appreciation.—**H. E. A.** 551
Ionisation Potential and the Size of the Atom.—**Prof. A. S. Eve** 552
A Novel Magneto-Optical Effect.—**Sir Oliver Lodge, F.R.S.** 553
Helicopters.—**A. Mallock, F.R.S.** 553
A Physical Interpretation of the Energy Quantum.—**Ian Aucken** 553
University Statstics of the United Kingdom, 1919–20 554
Protective Measures against X-rays and Radium 557
Cosmogony and Stellar Evolution. I. (*Illustrated.*) **By J. H. Jeans, Sec.R.S.** 557

Obituary:—

Dr. A. M. Kellas 560
Notes 561

Our Astronomical Column:—

Occultation of Venus 566
The Total Amount of Starlight 566
Periodicity of Variable Stars 566
Royal Sanitary Institute: Folkestone Congress, June 20–25 567
The Importance of Research in the Development of the Mineral Industries. By Sir Richard Redmayne, K.C.B. 568
The Genetics of Sex. By Prof. R. Ruggles Gates 571
University and Educational Intelligence . . . 572
Calendar of Scientific Pioneers 573
Societies and Academies 573
Books Received 575
Diary of Societies 576

© 1921 Nature Publishing Group